

US-PAT-NO: 6226617

DOCUMENT-IDENTIFIER: US 6226617 B1

TITLE: Product disposal system

DATE-ISSUED: May 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Suzuki; Tatsuya	Yokohama	N/A	N/A	JP
Ohashi; Toshijiro	Chigasaki	N/A	N/A	JP
Hiroshige; Yuzo	Tokyo	N/A	N/A	JP
Ochiai; Yuji	Tokyo	N/A	N/A	JP
Kitamura; Takashi	Abiko	N/A	N/A	JP
Tachi; Takahiro	Funabashi	N/A	N/A	JP
Hayashi; Masakatsu	Ushiku	N/A	N/A	JP

US-CL-CURRENT: 705/1, 705/8 , 705/9 , 707/104.1

**ABSTRACT:** A treatment processing system for determining proper and appropriate treatment methods and procedures in accordance with states of discarded articles and outputting the determined procedures. Treatment methods are decided which are desirable for manufactured articles for carrying out corresponding treatments of the manufactured articles. The treatment processing system includes a unit for reading out information affixed to the discarded articles, a unit for storing databases for required information, a treatment procedure decision unit, a treatment procedure altering unit, and a detector for detecting whether or not treatment is being executed in conformance with the relevant treatment procedure.

8 Claims, 36 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 33

----- KWIC -----

Brief Summary Text - BSTX (7): In the present states of the art, the information concerning the methods for carrying out the proper and appropriate treatments of the discarded articles is essentially difficult to acquire. By way of example, almost all of the manufactured articles contain little indication or information concerning the disassembling method, materials or substances of the component parts or the like. On the other hand, the manufacturers are not in the position to afford such information. Further, acquisition of such information takes an awful lot of time.

Brief Summary Text - BSTX (27): a means for reading out from a manufactured article being subjected to treatment component parts of the article and specific properties of the above-mentioned component parts,

Brief Summary Text - BSTX (29): an executing means for extracting the component parts to be separated on the basis of the predetermined specific properties as stored and specific properties of the component parts of concern, to thereby determine different treatment procedures for the treatment of the component parts to be separated and for the treatment of the other component

parts, respectively,

Brief Summary Text - BSTX (33): a step of reading out from a manufactured article being subjected to treatment component parts of the article and specific properties of the component parts,

Brief Summary Text - BSTX (34): a step of extracting the component parts to be separated on the basis of predetermined specific properties serving as information for detachment and specific properties of the component parts, and

Brief Summary Text - BSTX (36): In this manner, the proper and appropriate treatments conforming to the specific properties of the component parts such as, for example, materials/substances, harmful materials/substances, hazardous materials/substances and valuable things, respectively, can be realized, whereby the environment pollution due to the disposal of the harmful waste can be prevented.

Brief Summary Text - BSTX (38): a means for reading out from a manufactured article being subjected to treatment component parts of the article and specific properties of the component parts,

Brief Summary Text - BSTX (40): a means for extracting component parts constituting valuable things on the basis of the stored predetermined specific properties and the specific properties of the component parts,

Brief Summary Text - BSTX (45): a step of reading out from a manufactured article being subjected to treatment component parts of the article and specific properties of the component parts,

Brief Summary Text - BSTX (46): a step of extracting component parts constituting valuable things on the basis of predetermined specific properties indicating the valuable things and specific properties of the component parts,

Detailed Description Text - DETX (8): As the article information, there are required at least the information concerning the separation procedure(s) for taking out component parts from the manufactured article and the information concerning the facility or equipment demanded for the execution of the separation procedure, as illustrated in FIG. 30. Needless to say, the information concerning the separation procedure as well as the facilities information required for executing the separation procedure(s) are stored, being associated with each other.

Detailed Description Text - DETX (20): As the article information, there may be demanded in addition to the information shown in FIG. 30 the information concerning the dimensions or sizes of the manufactured article and the component parts, the materials or substances of the component parts and the installed positions or locations of the component parts, as is illustrated in FIG. 32. In the case of the example illustrated in FIG. 32, it is assumed that a three-dimensional CAD

drawing or the like is made use of for acquiring the information concerning the locations of the component parts. However, the present invention is never restricted to such measures. Parenthetically, by using the three-dimensional CAD drawing, the information concerning the dimensions of the manufactured article and the component parts and the locations or the installed positions of the component parts can be easily made available from the design drawing.

Detailed Description Text - DETX (34): As the article information, there is stored the information concerning the dimensions or sizes of the manufactured article and the component parts, materials or substances of the component parts and the locations of the component parts, as is illustrated in FIG. 32. It is assumed that a three-dimensional CAD drawing or the like is made use of for obtaining the information concerning the locations of the component parts. However, the present invention is never restricted to such measures. Of course, by making use of the three-dimensional CAD drawing, the information concerning the dimensions of the manufactured article and the component parts as well as the locations of the component parts can be easily made available from the design drawing.

Detailed Description Text - DETX (35): On the other hand, the information concerning the statutory regulations and standards and/or the information concerning hazardous and harmful materials or substances are acquired from the storage means 3 (step 200).

Detailed Description Text - DETX (36): As examples of the information concerning the statutory regulations and standards and/or the information concerning the harmful/hazardous material /substance, there may be stored lead, specified flons and/or the like as the use-inhibited materials/substances as shown in FIG. 34. In the case of the instant exemplary embodiment of the invention, the information concerning the statutory regulations and standards is stored in a statutory regulations/standards information database 32 with the information concerning the harmful/hazardous materials /substances being stored in a harmful/hazardous material/substance database 33.

Detailed Description Text - DETX (37): Further, in the processing/treatment system now under consideration, the information concerning the statutory regulations and the hazardous materials /substances is managed, which can be realized simply by managing entries representing the information concerning the segregation or detachment of the component parts from the manufactured article without incurring any problem.

Detailed Description Text - DETX (39): More specifically, decision is made as to whether the component parts of the manufactured article concerned contain the materials or substances same as or equivalent to those stored as the use-inhibited materials or substances. When this decision results in affirmation, the information concerning the locations or the installed positions of the harmful part/hazardous materials to be separated is extracted from the information concerning the manufactured article read out as mentioned previously.

Detailed Description Text - DETX (41): More specifically, presence/absence of the use-inhibited materials/substances as well as the locations thereof, if present, are outputted. As the output means

to this end, it is preferred to adopt the three-dimensional CAD. In accordance with the output information, the component parts made of the use-inhibited materials/substances can be distinctively or separately treated in the treatment-entrusted factory. By way of example, the parts formed of use-inhibited materials/substances may be stored with the other component parts being crushed or shredded.

Detailed Description Text - DETX (43): Further, when the component parts to be separated or segregated can be discriminatively grasped on a material-by-material basis (on the basis of the specific properties of the manufactured articles), the manufactured article can be treated separately for the individual materials (on a specific property basis). By way of example, component parts of a manufactured article may be crushed and recovered on a material-by-material basis.

Detailed Description Text - DETX (47): As the article information, there are required at least the information concerning the separation procedures for taking out component parts from the manufactured article and the information concerning the facility or equipment demanded for the execution of the separation procedure, as illustrated in FIG. 30. Needless to say, the information concerning the separation procedure and the information concerning the facilities required for executing the separation procedures are stored, being associated with each other.

Detailed Description Text - DETX (49): As the information concerning the facilities of the treatment-entrusted factory, there is required at least a facility list enumerating facilities which the treatment-entrusted factory is equipped with and the costs involved in the treatments, as illustrated in FIG. 35. In the case of the instant exemplary embodiment, it is assumed that the information concerning the objects for the treatment and the information concerning sizes of the parts capable of committing to the treatment are stored, being associated with each other. However, it is not always necessary to store them.

Detailed Description Text - DETX (58): As the article information, there are required at least the information concerning the separation procedure(s) for taking out component parts from the manufactured article and the information concerning the facilities or equipment demanded for the execution of the separation procedure, as illustrated in FIG. 30. Needless to say, the information concerning the separation procedure and the information concerning the facilities required for executing the separation procedure(s) are associated with each other for storage thereof.

Detailed Description Text - DETX (63): At first, information concerning the valuable things is read out from a market information database 35 to be inputted to the treatment procedure decision means 4. In this conjunction, the market information database 35 may store the purchase prices of the component parts, materials and the like on the market. Further, there may be stored in the market information database 35 in addition to the information concerning the purchase prices of the valuable things, the information concerning the demand for the valuable things, and the information concerning charging prices for the treatment of the harmful /hazardous materials/substances.

Detailed Description Text - DETX (64): Subsequently, the information concerning the parts and

the materials stored as the valuable things (e.g. material/substance names, material/substance numbers, part names, part numbers, purchase prices and the like) is selectively extracted from the above-mentioned information concerning the valuable things as inputted.

Detailed Description Text - DETX (65): In succession, the information concerning the component parts of the manufactured article is compared with the information concerning the parts and the materials of the above-mentioned valuable things selectively extracted, to thereby make decision as to whether or not there exist any component parts which are the valuable things.

Detailed Description Text - DETX (68): Next, the cost involved in the works for separation or segregating the parts inclusive of the valuable things as calculated as mentioned above is compared with the purchase price information of the parts including valuable things as extracted as mentioned above, to thereby make decision whether or not the treatment-entrusted factory can gain profits.

Detailed Description Text - DETX (81): Furthermore, the article specifications information storage unit 21b stores unique identification information such as manufacturer name, category of the manufactured article, etc., article specifications information such as article size, weight, component parts, etc. and treatment information such as disassembling method, assembling method or the like.

Detailed Description Text - DETX (94): As the databases, there may be provided an article specifications information database 31 for storing the specifications information of various manufactured articles, a statutory regulations/standards information database 32 for storing information concerning a variety of statutory regulations and standards, a harmful/hazardous material/substance database 33 for storing the information concerning the harmful/hazardous materials/substances, a treatment -entrusted factory specifications database 34 for storing information regarding the sorts or types of the facilities for treating the manufactured articles which the factory in charge of carrying out the treatment is equipped with, the treatment-destined object condition information indicating the conditions of the objects capable of undergoing the treatments by the facilities as well as the costs involved in the treatment, and a market information database 35 for storing information concerning the market quotation of the price of the valuable things such as usable manufactured articles, usable parts, materials/substances for reuse, materials for fuel and the information concerning the demand for the valuable things and the like.

Detailed Description Text - DETX (99): On the other hand, in the harmful/hazardous material/substance database 33, there is stored the information concerning the harmful/hazardous materials/substances as well as the treatment methods thereof. The information is also managed as a database implemented in the form of tables on a material/part basis by the enterprise or a given corporation.

Detailed Description Text - DETX (101): In the article specifications information database 31 shown in FIG. 9, basic information, design information, and the like are stored in the address heading fields. There exist such data which correspond to the addresses of the address heading

fields, respectively. The data portion corresponding to the basic information may contain the categories of the manufactured articles indicating the names of the manufactured articles, manufacturer names, model names, manufacturing numbers and the like. Similarly, the data portion corresponding to the design information contains screen sizes, outer dimensions and the like. Further, as the design information (2), there are stored the information concerning the names of the component parts, materials/substances thereof, material/part manufacturers, grade, weight, number, dimensional information and the intra-article part location information . Additionally, there may be stored such information which concerns disassembling or disintegrating procedures, reuse-destined parts, use history, part exchange dates, etc., respectively, as the component part information . These article specifications information may be stored on a manufactured article basis or stored en bloc for all the manufactured articles as a database.

Detailed Description Text - DETX (102): In the market information database 35, there are stored the information which concerns the market quotation prices of the valuable things such as the used articles, used parts, materials/substances for recycling, fuel-destined materials/substances and the like, the information concerning the demand for the valuable things mentioned above, stock information of the parts for the purpose of maintenance, management and so forth internally of the enterprise or by the corporation entrusted, as shown in FIG. 10.

Detailed Description Text - DETX (103): The market information database 35 shown in FIG. 10 stores therein the market prices of the used articles on an article type basis so that the market price information can be obtained when the restored article such as the restored televisions are to be recycled as the used article. Besides, the information concerning the market prices of the used parts is also stored so that the market prices of the component parts of the manufactured article can be made available when they are to be recycled as the used parts. Similarly, the purchase price information, the demand information and other for the valuable materials/substances for recycling may be stored on a material -by-material basis or additionally on a grade basis (e.g. on the basis of grade, purity and the like indicated by virgin material manufacturer) and/or on an application-by-application basis.

Detailed Description Text - DETX (127): As the manufactured article specifications information, there are stored basic information/design information concerning the component parts (1), design information concerning dimensions or sizes (2) and design information concerning the disassembling or disintegrating procedure for the manufactured article (3), as shown by the entries in the address headers, respectively.

Detailed Description Text - DETX (129): The design information (1) carries information concerning the materials /substances, weights and the like of the box-like housing, the cover, the printed circuit board assembly and others which are the component parts of the manufactured article 21.

Detailed Description Text - DETX (131): The design information (3) carries the separation procedures for the component parts, wherein the separation procedures cover both the case where the component parts are separated by breaking them and the case where the component parts are

separated without being broken.

Detailed Description Text - DETX (138): Although the information concerning the dimensions of the manufactured article and the component parts as well as the information concerning the locations or positions of the component parts internally of the manufactured article are shown in the form of the three-dimensional CAD data in FIGS. 19 and 20, this is only for the purpose of illustration. These information may be given as the two-dimensional CAD data. Further, as other dimensional information having a high degree of necessity, there may be mentioned location information for the manufactured article which carries the information concerning locations along which the component parts are to be separated (joints between the component parts, to say in another way).

Detailed Description Text - DETX (141): At this juncture, it should be mentioned that the information concerning the relevant manufactured article 21 as read out contains at least the information concerning the component parts of the manufactured article 21, the information concerning the materials/substances of the component parts and the information concerning the location or positions of the component parts in the manufactured article as well as the information concerning the disassembling procedure. Further, the dimensional information may be added as occasion requires.

Detailed Description Text - DETX (142): In the case of the manufactured article shown in FIG. 18, contents printed on the rating label 215 in the form of a bar code (manufacturer name, article name, model, manufacture No.) is read out by means of the bar code reader 16, whereon the manufactured article specifications information for the article 21 is read out from the manufactured article specifications information database on the basis of the read-out information to be subsequently inputted to the treatment procedure decision means 4. (Step 302: Selection of the information concerning the component parts constituting the manufactured article)

Detailed Description Text - DETX (143): Next, as a preparation for making decision as to whether the component parts of the manufactured article of concern contain any harmful/hazardous material/substance, the information concerning the component parts constituting the manufactured article concerned (part names, part Nos., materials/substances and the like) is selectively extracted from the above-mentioned manufactured article information as inputted. (Step 303: Reading/inputting of the information concerning the harmful/hazardous materials /substances)

Detailed Description Text - DETX (144): As an additional preparation for making decision as to whether the component parts of the manufactured article concerned contain any harmful/hazardous material/substance, the information concerning the harmful/hazardous materials /substances to be segregated (see FIG. 8) is read out from the statutory regulations/standards information database 32 and the harmful/hazardous material/substance database 33 and inputted to the treatment procedure decision means 4. (Step 304: Selection of the information concerning harmful parts and materials/substances and the information concerning hazardous parts and materials/substances)

Detailed Description Text - DETX (145): In succession, the information concerning the harmful

parts and the materials/substances thereof as well as the information concerning the hazardous parts and the materials/substances thereof (part names, part numbers or Nos., materials/substances, etc.) is selectively extracted from the above-mentioned input information concerning the harmful/hazardous materials /substances to be segregated. (Step 305: Decision as to whether or not harmful parts/hazardous parts to be separated are contained in the manufactured article)

Detailed Description Text - DETX (146): Next, the information concerning the component parts constituting the concerned manufactured article (part names, part Nos., materials/substances, etc.) as extracted selectively in the step 302 is compared with the information concerning the harmful parts to be segregated and the materials/substances thereof as well as the information concerning the hazardous parts and the materials/substances thereof (part names, part numbers or Nos., materials/substances, etc.) as extracted selectively in the step 304, to thereby make decision as to presence/absence of the harmful/hazardous materials/substances to be segregated in the component parts of the manufactured article of concern.

Detailed Description Text - DETX (147): To this end, decision may be made as to whether the materials/substances are same or not or whether the part Nos. are same or not. To this end, identification information for discriminatively indicating whether or not harmful material or hazardous material is contained in the component parts may be affixed to the manufactured article or stored in the database incorporated in the treatment processing system. In this conjunction, however, it is expected that recognition of the harmful/hazardous material/substance may differ between the time points of shipping the manufactured article and the waste treatment thereof. Accordingly, the identification information must be of universal nature unique and corresponding to the characteristics of the component parts, respectively.

Detailed Description Text - DETX (149): In the case of the manufactured article 21, the comparison of both the information mentioned above will show that the printed circuit board assembly 213 contains lead (Pb). Accordingly, decision will be made to the effect that the printed circuit board assembly 213 is a component part containing harmful substance. Thus, the step 306 is executed. (Step 306: Extraction of the information concerning the locations/positions of the harmful parts /hazardous parts to be separated, part names, materials/substances, separation procedure, etc.)

Detailed Description Text - DETX (150): The information concerning the locations/positions of the harmful parts /hazardous parts to be separated, the disassembling or separation procedure, etc. is extracted from the read-out information concerning the manufactured article.

Detailed Description Text - DETX (154): The separation procedure information for the component parts to be separated as extracted in the step 306 is compared with the information concerning the facilities of the treatment-entrusted factory as read out in the step 307, to thereby select the treatment procedure which can be executed with the facilities which the treatment-entrusted factory is equipped with.



Detailed Description Text - DETX (160): Even for the manufactured article for which decision is made that neither harmful parts nor the hazardous parts exist, the information concerning the facilities of the treatment -entrusted factory is read out from the treatment-entrusted factory specifications information database 34 as in the case of the step 307, to be subsequently inputted to the treatment procedure decision means 4. (Step 310: Selection of the information concerning a shredder from the information of the facilities of the treatment-entrusted factory)

Detailed Description Text - DETX (164): The information concerning the dimensions/sizes of the remainders left after the detachment of the component parts to be segregated (or the information concerning the dimension of the manufactured article itself when it is decided that no component part to be separated exists) is determined on the basis of the information concerning the manufactured article as read out in the step 301 and compared with the above-mentioned information concerning the shredder (treatable dimensions, sizes, etc.) selectively extracted in the step 301, for making decision as to:

Detailed Description Text - DETX (171): On the basis of the dimensional information of the remainders left after the detachment of the component parts to be segregated and the information concerning the dimension or size treatable by the shredder, the locations for cutting in precedence to the shredding are determined.

Detailed Description Text - DETX (187): The information concerning the manufactured article 21 is first read out not only from the information affixed to the manufactured article 21 but also from the article specifications information database 31 when occasion requires, whereon the information as read out is inputted to the treatment procedure decision means 4 similarly to the case of the processing flow illustrated in FIG. 12. (Step 322: Selection of the information concerning the component parts constituting the manufactured article).

Detailed Description Text - DETX (188): Next, as a preparation for making decision as to whether the component parts of the manufactured article of concern contain any component parts to be separated, the information concerning the component parts constituting the manufactured article of concern (part names, part Nos., materials/substances and the like) is selectively extracted from the above-mentioned manufactured article information as inputted. (Step 323: Reading/inputting of the information concerning the facilities of the treatment-entrusted factory).

Detailed Description Text - DETX (192): In succession, the above information concerning the component parts extracted selectively is compared with the information concerning the facilities of the treatment-entrusted factory for determining presence or absence of the component parts to be separated. When this decision results in presence, the processing proceeds to a step 326 while proceeding to a step 328, if otherwise. (Step 326: Extraction of the information concerning the locations or positions of the component parts to be separated, part names, materials/substances, separation procedure, etc.)

Detailed Description Text - DETX (193): The information concerning the locations or positions, the part name, the materials/substances of the component parts to be separated, the separation

procedure, etc. is extracted from the above-mentioned information concerning the manufactured article as read out. (Step 327: Determination of the separation procedure by taking into account the information concerning the facilities of the treatment-entrusted factory).

Detailed Description Text - DETX (194): The separation procedure information for the component parts to be separated as read out in the step 326 is compared with the information concerning the facilities of the treatment-entrusted factory read out in the step 323, to thereby determine the treatment procedure which can be executed with the facilities installed in the treatment-entrusted factory and which involves low cost in the treatment.

Detailed Description Text - DETX (195): More specifically, the treatment procedures for separation the component parts of metal material is stored in association with the facilities information . Accordingly, when the ordinary shredder is made use of, the procedure suited for separation the metallic component parts is selected. Further, when a plurality of such separation procedures are available, the procedure involving the lowest cost in the treatment is selected.

Detailed Description Text - DETX (200): Processings for reading/inputting of the information concerning the manufactured article (step 341) and selecting the information concerning the component parts constituting the manufactured article (step 342) are similar to those illustrated in FIG. 12. Thus, description therefor will be omitted. (Step 343: Reading/inputting of the information concerning valuable things).

Detailed Description Text - DETX (201): Next, the information concerning the valuable things (see FIG. 10) is read out from the market information database to be inputted to the treatment procedure decision means. (Step 344: Selection of the information concerning component parts and materials/substances which are variable things).

Detailed Description Text - DETX (202): Subsequently, the information concerning the parts and the materials which are the valuable things (material/substance names, material/substance numbers, part names, part numbers, purchase prices and the like) is selectively extracted from the above-mentioned inputted information concerning the valuable things. (Step 345: Decision as to presence or absence of the component parts containing valuable things).

Detailed Description Text - DETX (203): In succession, the information concerning the above-mentioned component parts as extracted selectively is compared with the information concerning the parts and the materials of the above-mentioned valuable things as extracted selectively, to thereby make decision as to whether or not there exists the component part(s) which are the valuable things. If the above decision results in affirmation, the processing proceeds to a step 346, and if otherwise, the processing proceeds to a step 347. (Step 346: Extraction of the information concerning the locations/positions of the component parts containing valuable things, part names, materials/substances, separation procedure, purchase prices, etc.).

Detailed Description Text - DETX (204): The information concerning the locations/positions, the part name, the materials/substances of the parts to be separated, the disassembling procedure, etc.

is extracted from the above-mentioned information concerning the manufactured article as read out. (Step 347: Reading/inputting of the information concerning the facilities of the treatment-entrusted factory).

Detailed Description Text - DETX (206): Next, on the basis of the information concerning the component parts containing valuable things as extracted and the information concerning the cost involved in the treatment to be carried out in the treatment-entrusted factory as inputted as mentioned above, the cost involved in the work for separation the component parts is arithmetically determined or calculated. This processing can be realized in accordance with the concept similar to that underlying the work cost calculation processing described hereinbefore in conjunction with the processing flow illustrated in FIG. 12. (Step 349: Decision as to whether or not the component parts containing the valuable things are to be separated).

Detailed Description Text - DETX (207): Subsequently, the work cost involved in separation the component parts containing the valuable things as calculated in the manner mentioned above is compared with the purchase price information of the component parts containing the valuable things as extracted as mentioned above, to thereby make decision as to whether or not the component parts containing the valuable things worthy to be separated are present or not by deciding whether or not such detachment of the parts is profitable to the treatment-entrusted factory.

Detailed Description Text - DETX (208): For realizing the decision with higher accuracy, cost for stocking, cost for transportation and other costs should be taken into consideration in the decision of the cost for the separation work. The information concerning these costs should be stored in the treatment-entrusted factory specifications database 34 and the market information database. (Step 350: Extraction of the information concerning the locations/positions of the component parts to be separated, part names, materials/substances, separation procedure, etc.).

Detailed Description Text - DETX (209): Subsequently, the information concerning the locations/positions of the parts to be separated, the part names, the materials/substances of the parts, the separation procedure and others is extracted from the information concerning the manufactured article as read out as mentioned above.

Detailed Description Text - DETX (210): The succeeding processings for selecting the information concerning the shredder from the information concerning the facilities of the treatment-entrusted factory (step 351), making decision as to whether the remainders left after the detachment of the component parts to be segregated can be crushed intact (step 352), determining the location where the component part(s) is to be cut or sheared on the basis of the information concerning the manufactured article (step 353), and outputting the treatment procedure are essentially same as the processing flow described hereinbefore by reference to FIG. 12. Accordingly, any further description of these processings will be unnecessary.

Detailed Description Text - DETX (253): (1) Extraction of the Alternative Procedure from the Part Separation Procedure Information Contained in the Information Concerning the Manufactured

## Article

Detailed Description Text - DETX (254): The part separation procedure is extracted from the information concerning the manufactured article, which information has been read out from the manufactured article subjected to the treatment or read out from the storage means 3, as occasion requires, to thereby decide the presence or absence of the alternative procedure. If the alternative procedure 1 present, the procedure as found is selected as the candidate for the alternative procedure. Parenthetically, concerning the examples of the separation procedure information, reference may be made to "D DESIGN INFORMATION (3), PART Separation PROCEDURE" shown in FIG. 20.

Detailed Description Text - DETX (256): Unless the candidate for the alternative procedure is found from the part separation procedure information in the processing described in the above paragraph (1), the part of concern is separated by cutting. To this end, undermentioned methods or processings may be adopted.

Detailed Description Text - DETX (257): (a) On the basis of the location information and the dimensional information concerning the part to be separated as extracted from the above-mentioned information concerning the manufactured article as read out, the position or location at or along which the part of concern can be cut without being impaired is determined. Parenthetically, as to the examples of the location or position information and the dimensional information of the part (s) to be separated as contained in the above-mentioned information concerning the manufactured article read out, reference may be made to "C DESIGN INFORMATION (2), DIMENSIONAL INFORMATION", shown in FIG. 19.

Detailed Description Text - DETX (259): When the presence of other part(s) of harmful/hazardous material/substance is decided, the position or location information and the dimensional information of the part of harmful or hazardous material/substance as decided are extracted from the above-mentioned information concerning the manufactured article as read out, as in the case of the processing described in the above-mentioned paragraph (a), whereupon the location information and the dimensional information of the part to be separated is extracted to thereby determine the position at or along which the part of concern as well as the part of harmful or hazardous material/substance can be cut without being damaged. In that case, the cutting area is also calculated.

Detailed Description Text - DETX (273): The working robot mentioned above 81 is equipped with the detecting means 7 for monitoring a screw loosening torque of the working robot 81. When it is detected by the detecting means 7 that the screw can not be separated even with a screw loosening torque of magnitude greater than a predetermined value, the detecting means 7 sends to the treatment procedure altering means 6 the information "work can not be performed in conformance with the treatment procedure; removal of screw is impossible". In response thereto, the treatment procedure altering means 6 acquires from the treatment procedure decision means 4 mentioned previously the information concerning the intrinsic purpose of the work which could not be carried out, to thereby decide that the work is "the work for segregating a harmful material" and acquires

the information that the parts containing the harmful material/substance are the cell and the printed circuit board.

Detailed Description Text - DETX (274): In view of the imposed condition that in the case of the manufactured article containing parts of harmful material/substance, the latter must be segregated without fail, the treatment procedure altering means 6 extracts the information concerning the part separation procedure from the information concerning the manufactured article as read out from the above-mentioned manufactured article 21 being subjected to the treatment or from the article specifications information database 31, as occasion requires, to thereby make decision as to presence or absence of the alternative procedure (concerning the example of the part separation procedure, reference may be made to "D DESIGN INFORMATION (3), PART Separation PROCEDURE" shown in FIG. 20). When the alternative procedure is present, it is selected as the candidate for the alternative procedure to thereby generate another separation method or procedure (method by cutting). On the basis of the location information and the dimensional information concerning the part to be separated as extracted from the above-mentioned information read out, the position or the location at or along which the part of concern can be cut without being impaired is determined. Parenthetically, as to examples of location or position information and the dimensional information of the part (s) to be separated as contained in the above-mentioned information concerning the manufactured article as read out, reference may be made to "C DESIGN INFORMATION (2), DIMENSIONAL INFORMATION" shown in FIG. 19.

Detailed Description Text - DETX (277): (1) Calculation of the Treatment Cost Required for the Alternative Procedure Acquired from the Part Separation Procedure Information Mentioned Previously

Detailed Description Text - DETX (278): The part separation procedure information (refers to FIG. 20, "D DESIGN INFORMATION (3)") is acquired from the article specifications information read out as mentioned previously or acquiring the treatment work cost information from the treatment-entrusted factory specifications information (see FIG. 11) mentioned previously, to thereby calculate the treatment cost required for the alternative procedure acquired from the above-mentioned part separation procedure information .

Detailed Description Text - DETX (280): On the basis of the information concerning the cutting area computed as mentioned previously as well as the information concerning the work cost involved in the cutting treatment as acquired from the treatment-entrusted factory specifications information (see FIG. 11), the treatment cost required for the alternative procedure acquired from the above-mentioned part separation procedure information is calculated.

Detailed Description Text - DETX (284): FIG. 29 shows another exemplary embodiment of the invention. In the case of the system illustrated, the detecting means 7 is constituted by a unit including an image pick-up device such as a television camera. It is assumed that the state of the manufactured article being subjected to the treatment is checked by making use of the image information picked up by the television camera. To this end, there is stored in the manufactured article specifications information database the image information of the discarded article in the

fresh state thereof. With the treatment processing system, the model and other particulars of the discarded article of concern are identified for acquiring from the article specifications information database mentioned previously the image information of the article when it was in the fresh state and the specifications information admitting the parts thereof to be reused (check standards), which represents, for example, the reference information stored in element 36 of FIG. 6 which provides standards with respect to whether the article can be recycled from the viewpoint of wear or abrasion of the article material. In succession, check is performed by comparing the image information of the discarded article and the image information thereof in the fresh state. From the image information, the number of injuries and sizes thereof, for example, can be detected. In this conjunction, it is required that the manufactured article be provided with some measures for allowing a front wall, a top wall or surface thereof to be discriminatively identified. By way of example, some manufactured article may have individual walls or surfaces affixed with identifier numbers, respectively. In the treatment processing system, the information concerning the number of injuries and the sizes thereof as detected is compared with the specifications information admitting the reuse of the parts (check standards), whereby the treatment method is decided and thus the treatment procedure can be determined. By way of example, when it is decided that reuse as the component part is impossible because of a large number of injuries, then a treatment procedure for recycling as the material or substance may be generated and outputted.